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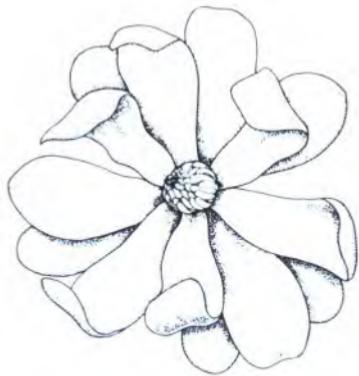
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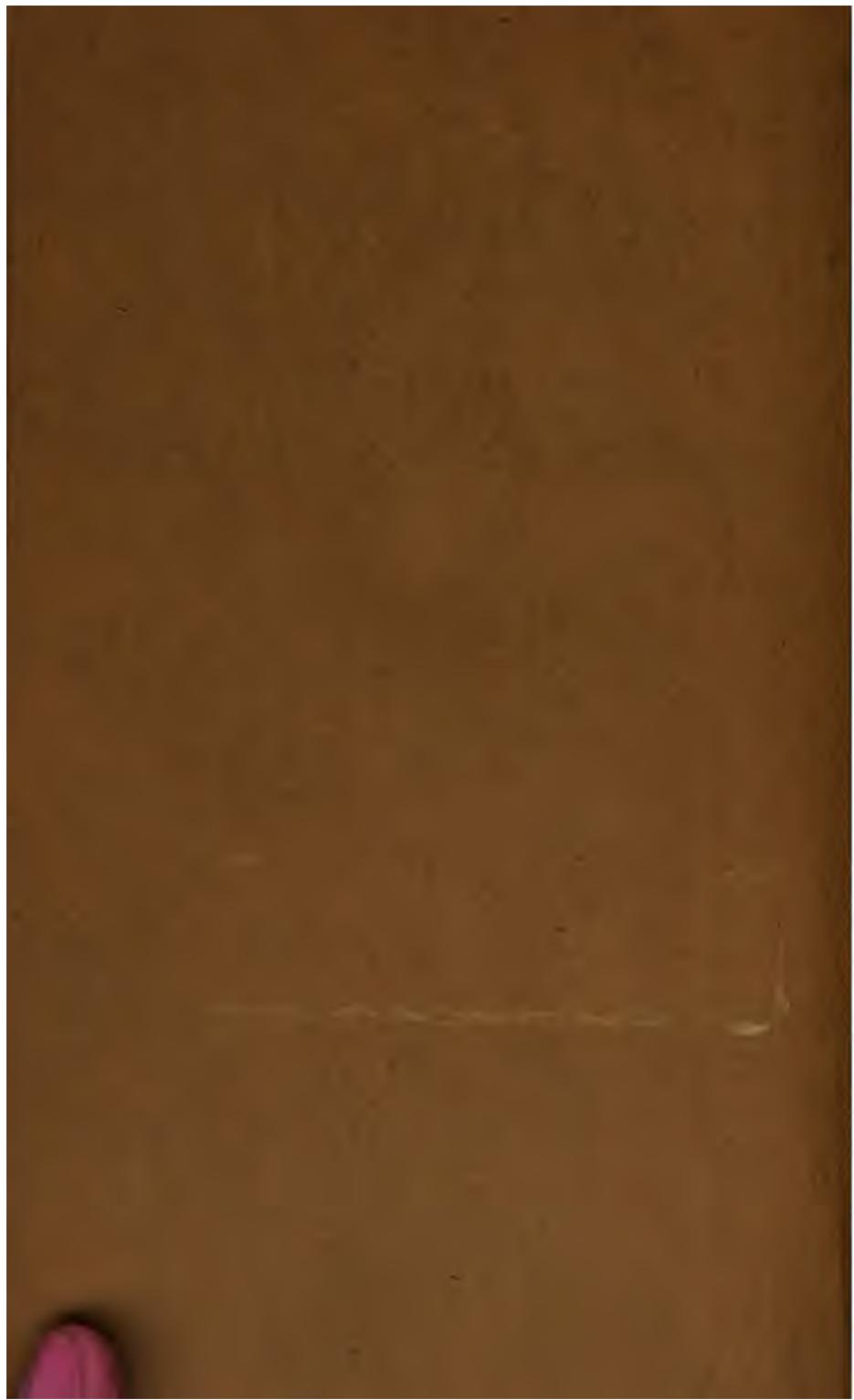
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A

SYNOPSIS

OF THE

BRITISH RUBI.

BY

CHARLES C. BABINGTON, M.A., F.L.S., F.G.S. &c.

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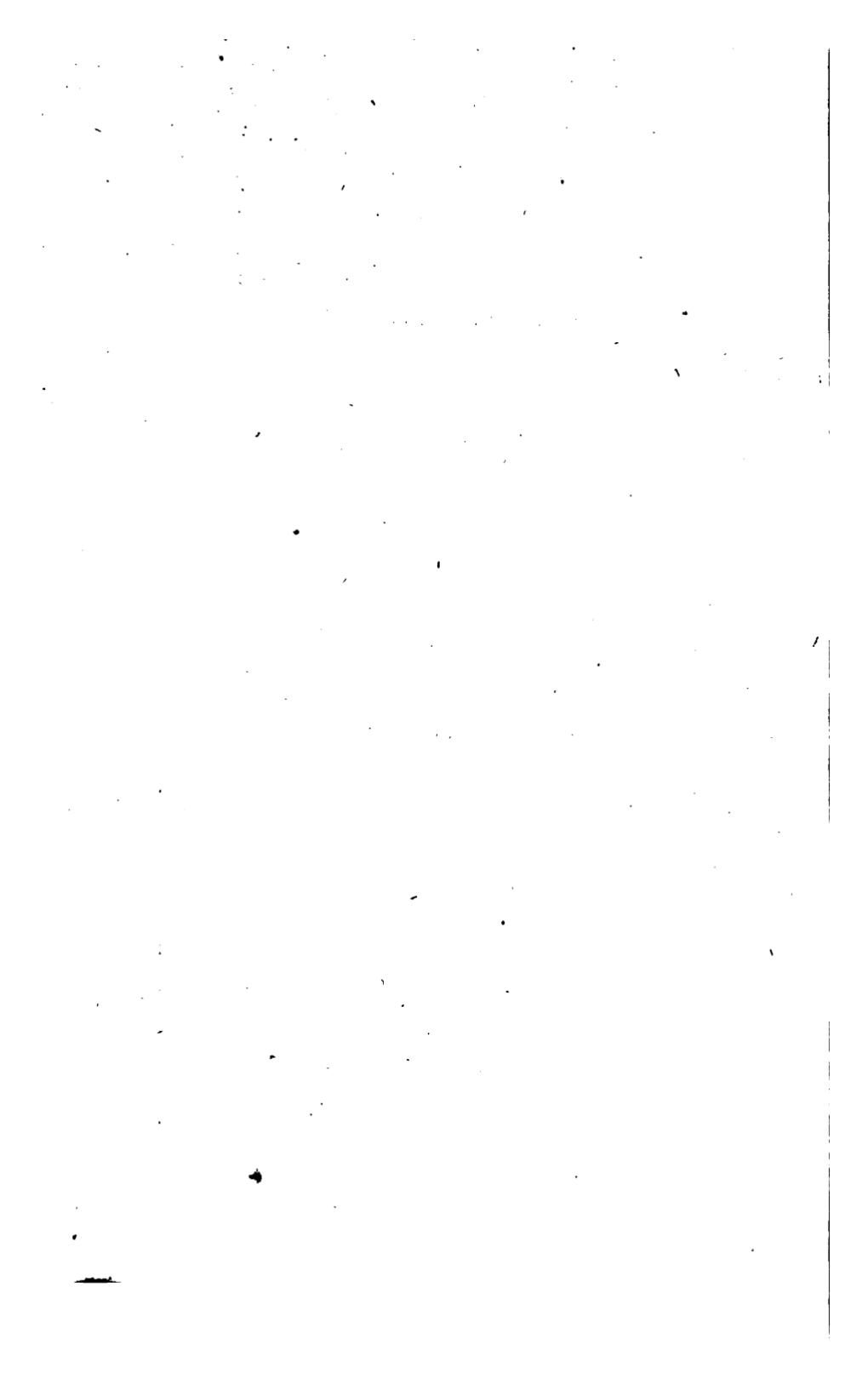
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[Extracted from the ANNALS AND MAGAZINE OF NATURAL HISTORY, vol. xvii.,
and TRANSACTIONS of the EDINBURGH BOTANICAL SOCIETY, vol. ii.]

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A SYNOPSIS
OF THE
BRITISH RUBI.

IT is only of late years that the fruticose species of *Rubus* have received the attention which they deserve: botanists were long contented to call them all *R. fruticosus* or *R. cæsius*, and the introduction by Smith of another name (*R. corylifolius*) must have appeared to be a very great innovation. Each of these is a collective species, by which I mean, one in which many forms, doubtless constituting truly distinct species, are included. Hence the great diversity in the mode of applying these names.

All students of this very difficult genus are extremely indebted to Weihe and Nees v. Esenbeck for the publication of their splendid work the 'Rubi Germanici,' without which it would have been scarcely possible to attain that knowledge of Brambles which we now possess; and all will agree, that for extending our acquaintance with British *Rubi* no name justly stands so high as that of Borrer, to whom we owe the elaborate account of these plants contained in Hooker's 'British Flora' (ed. 2 and 3), and the descriptions of many species in the eminently beautiful but far too little known 'Supplement to English Botany.' Dr. Lindley, in his 'Synopsis of the British Flora' (ed. 1), gave the specific characters of twenty-three species, mostly translated avowedly from the work of Weihe and Nees, but including several supposed to be undescribed. He states that he had attained his knowledge of them from plants growing in the garden of the Horticultural Society, and that he was "satisfied that their distinctions are permanent and important." In his 'Flora of Shropshire' Mr. Leighton has collected together the opinions of the above-mentioned botanists, and also of Nees v. Esenbeck, by sending a perfect set of specimens to each of them, accompanied by corresponding numbers. He has also described the plants with great accuracy, and thus placed students as nearly as possible in the same situation as himself. Without attempting to enumerate all those who are now studying *Rubi*, I cannot pass unnoticed the very valuable papers by Dr. T. Bell Salter in the 'Phytologist' and 'Annals of Natural History,' by which he has shown himself to

be peculiarly qualified to become the illustrator of this genus. I had hoped that he would have undertaken such a review of it as that upon which I have now ventured; this his professional duties prevent. I must take the present opportunity of acknowledging myself to be very greatly indebted to him, both for the gift of specimens and also for the communication of much valuable information.

To Mr. E. Lees, a gentleman who has long paid attention to these plants, I am indebted for a very extensive series of specimens. Many other botanists have liberally assisted me in a similar manner; I would more especially mention the Rev. A. Bloxam and Mr. H. O. Stephens.

In the following pages I have endeavoured to apply those characters to the discrimination of the British species which have been found to be the most permanent by the best British and continental authorities, and would more especially refer the student to the following works in addition to those already noticed: the 'Flora Silesiae' of Wimmer and Grabowski (Breslaw, 1827); 'Novitiarum Flora Sueciæ mantissa altera et tertia' of Fries (Upsala, 1839—1842); 'Monographia Ruborum Sueciæ' of Arrhenius (Upsala, 1840); and 'Monographie des Rubus de Nancy' of Godron (Nancy, 1843). It has also been my endeavour to ascertain what forms are to be considered as species and what only as varieties. Had views concerning species been adopted similar to those elucidated in the invaluable 'Rubi Germanici,' this synopsis would have contained sixty-three species at the least, and with every wish to reduce them as far as nature will allow, they still amount to about half that number. Several of these are now described for the first time; of them full descriptions are given; of the others the technical characters alone are introduced, accompanied by such notes and observations as appeared to be requisite.

In so large an assemblage of species it becomes necessary to attempt a separation into groups, but in this, as in all rich and natural genera, it is found to be nearly impossible to do so. Many species are easily referable to sections, such as those which I have adopted; but their artificial character is shown by other species which would belong to one section when young, and to another in their maturer state, or which possess characters so nearly intermediate, as to make it very difficult to decide in which section they should be placed. Still the divisions adopted in this essay have been found to be more constant and convenient than those derived from other peculiarities which are employed by some authors.

It is not pretended that all the forms are correctly referred to their true places, but simply that the information within my

reach and the best judgement which I can form have been used in this attempt at their arrangement. Additional study will doubtless show that many alterations are requisite; will perhaps prove that some of those now considered as varieties are really specifically distinct, and demonstrate that several of my species may be combined with others. In those cases in which plants are described as new, every endeavour has been made to ascertain that they are not already published in the works of continental botanists; but the want of authentic specimens has added greatly to the difficulty of determining many of those species which are not represented in the 'Rubi Germanici,' and made it far from improbable that some of my names, and also those of Dr. Salter, will ultimately be superseded. It would appear that botanists generally are very little inclined to distribute authentic specimens of *Rubi*; indeed, when we consider the variable character of many species, and the trouble attending the preservation of sufficiently characteristic specimens of all, we can hardly wonder at their rarity. In my own case, from residing in a district far from rich in brambles, most of my specimens have been collected during botanical tours, when it was scarcely possible to find space for the preservation of more than a very few specimens from each locality.

It is unnecessary to prolong these preliminary observations with remarks upon the value of characters, as the following descriptions will show upon what points it has appeared most desirable to place confidence; but it may be as well to state, that the form and armature of the matured barren shoot, the form of its leaves, the general form and structure of the panicle and its armature, and in some cases its foliage, and the direction of the calyx of the fruit, seem most deserving of attention. The shape of the petals, the colour of the styles, the form of the torus and of the primordial fruit, are points which will probably well repay a careful study; unfortunately my attention was not drawn to them until the opportunities for their examination had passed away. They are strongly recommended to the notice of botanists.

As it has been thought better not to encumber this paper with synonyms, only those references are given which appeared requisite for the more certain determination of the plants.

In conclusion, I must crave the indulgence of those who may honour this synopsis with their attention, and assure them that whatever errors they may find in it are not the result of carelessness, but caused by the paucity of our knowledge of plants which have been too generally neglected. It is hoped that by publishing the knowledge that they may obtain, all botanists will assist in perfecting our acquaintance with a genus, which more than most others requires a division of labour.

RUBUS, *Linn.*

Ordo naturalis ROSACEÆ.

Tribus DRYADEÆ.

Character genericus. Cal. quinquepartitus. Petala quinque. Stamina indefinita. Styli subterminales. Carpella indefinita, drupacea, supra torum protuberantem non carnosum collocata. Semen pendulum, prope basin styli affixum.

A. FRUTESCENTES.

* Caules erecti; folia pinnata.

1. *R. Idæus* (Linn. !); caule suberecto tereti pruinoso, aculeis setaceis rectis, foliis quinato-pinnatis ternatis, floribus axillaribus terminalibusque corymbosis pendulis, fructibus lanuginosis.

R. Idæus, *Linn. Sp. Pl.* 706; *Eng. Bot.* 2442; *Rubi Germ.* 107. t. 47.

Stems 4—8 feet high, downy, armed with setaceous straight declining purple, or on the white-fruited plant pale, prickles, which vary greatly in number. Leaves pinnate, of two pairs and an odd leaflet, snowy-white beneath; terminal leaflet ovate or cordate with a long stalk, lateral ones ovate, nearly or quite sessile; on the flowering-shoots ternate. Fruit red or amber-coloured.

β . *trifoliatus* (Bell Salt. !); caule polito alto, aculeis paucis minimis rectis, foliis ternatis, foliolato terminali pedicellato, panicula laxa, fructibus sanguineis. *Ann. Nat. Hist.* xvi. 365.

γ . *Leesii*; caule tomentoso alto, aculeis paucis brevissimis purpureis, foliis ternatis, foliolis omnibus rotundato-ovatis subsessilibus lateralibus terminali incumbentibus, panicula fructuque ignotis.

R. Idæus c. fragariæ-similis, *Lees*! in *Lond. Cat. of Br. Plants* (name only).

In woods and hilly places. γ . In a wood near Ilford Bridges, three miles from Linton, Devonshire, *Mr. E. Lees*. June.

Obs. 1. Our var. β . is at least as large as the normal plant. Not so the trifoliate var. *microphyllus* (Wallr. Sched. Crit. 226), which is much smaller, has leaves of only half the size, and is branched from the base.

Obs. 2. Our var. γ . is a very curious plant, of which the barren stems alone were found. Its three leaflets being all nearly or quite sessile and very round, give it greatly the appearance of a distinct species. It is well deserving of the attention of botanists visiting the north of Devon.

** Caules plerique suberecti; folia digitata vel subpinnata; panicula laxa.

2. *R. suberectus* (Anders. !); caule suberecto anguloso, aculeis paucis minimis rectis subulatis, foliis quinatis septenatis, foliolis

flexilibus : terminali cordato-ovato acuminato infimis subsessilibus, *ramorum floriferorum basi attenuatis*, panicula subsimplici, sepalis a fructu (atro-sanguineo) reflexis.

R. suberectus, *Anders. in Trans. Linn. Soc.* xi. 218. t. 16; *Eng. Bot.* 2572; *Sm. Eng. Fl.* ii. 406; *Arrhen. Rub. Suec.* 19.

Stems 3—4 feet high, nodding at the end, glabrous. Prickles enlarged suddenly at the base. Leaves green on both sides, paler beneath, pilose; on the flowering shoots ternate, all much narrowed to their base, terminal one scarcely emarginate below. Panicle usually unarmed, or with small hooked prickles. Torus conical.

B. trifoliatus (Bell Salt. !); caule polito, aculeis paucis, foliis ternatis, panicula elongata laxa simplici, "fructibus sanguineis." *Ann. Nat. Hist.* xvi. 365.

Boggy woods and heaths. July and August.

Obs. 1. The typical form of this plant cannot be confounded with any of our other species. It has quite the habit of *R. Idæus*; its leaves are usually septenate by the separation of two leaflets from the base of the middle leaflet, they are thin, flexible and slightly pilose or quite glabrous; the petioles and rachis bear a few short hooked prickles. The inflorescence is small, of a few solitary axillary flowers, and a small open terminal raceme. The floral leaves have all their leaflets narrowed to the base, not cordate.

Obs. 2. *R. fissus* (Lindl.) seems scarcely to differ from this species, except by having more numerous and scattered prickles the calyx of the fruit erecto-patent, and the fruit "bright red." In Lindley's description of his *R. fastigiatus* (Syn. ed. 1. p. 91), which he declares to be *R. fissus* (Syn. ed. 2. p. 92), he describes the calyx as reflexed. It would thus seem either that he lays but little stress upon that character, or that, if it is of value, his *R. fissus* is not that of Leighton (Fl. Shrop. 225). The presence of "bright red" fruit in Bell Salter's *R. suberectus* *B. trifoliatus* shows that that cannot be depended upon as a certain distinction between *R. suberectus* and *R. fissus*.

Obs. 3. A garden specimen of *R. suberectus* in Smith's herbarium, which was given to him by Mr. Edw. Forster, is accompanied by the observation, "The plant was given to me by Geo. Anderson, and is therefore authentic. E. F." It is exactly our plant.

3. R. plicatus (W. et N.); caule suberecto anguloso, aculeis æquilibus parum deflexis in caulis angulis congestis, foliis quinatis plicatis, foliolo terminali cordato-ovato acuminato infimis subsessilibus, *ramorum floriferorum lateralibus rhombo-ovatis basi dilatatis*, panicula subsimplici racemosa, sepalis a fructu (atro) reflexis.

R. plicatus, *Rub. Germ.* 15. t. 1; *Eng. Bot. Suppl.* 2714.
R. fruticosus, *Arrh. Rub. Suec.* 23.

Stems 3—4 feet high, glabrous. Prickles slender, dilated at the base. Leaves rarely 7-nate, green on both sides, paler beneath, pilose, unequally and acutely serrate; on the flowering shoot generally ternate, basal leaflets dilated below especially on one side where they are often lobed, terminal one narrowed to its rather emarginate base. Petioles with hooked prickles. Peduncles simple, elongated, patent; terminal flower nearly sessile. Bracts lanceolate.

β . *carinatus* (Bell Salt. !); *aculeis falcatis, foliolis omnibus elliptico-lanceolatis basi apiceque acutis carinatis subtus venis prominentibus, panicula simplici, pedunculis longissimis, "fructibus atro-rubentibus."* *Ann. Nat. Hist.* xvi. 365.

Stony but rather damp places in the north. Somewhat boggy places in Sussex, *Mr. Borrer*. β . Burnt House, Isle of Wight, *Dr. Bell Salter*. July and August.

Obs. 1. Near the extremity of the barren shoots the prickles are more hooked, but as that part is usually dead and lost at the flowering season the prickles are then all nearly straight.

Obs. 2. The β . *carinatus* does not agree well with this species and may prove distinct. All its leaves, especially those of the flowering shoot, differ remarkably from those of the true *R. plicatus*, to which I refer many plants which would be named *R. suberectus* by numerous English botanists; the leaves of the flowering shoots combining with general habit to point out their true location.

Obs. 3. The *R. nitidus* from "Snelsmore Common near Newbury," gathered by Mr. Bicheno and preserved in Smith's herb., appears almost certainly to be *R. plicatus*; as are also the *R. suberectus* from Frant and from Ashdown Forest. *R. nessensis*, a cultivated specimen from Mr. J. Mackay, and one named *R. suberectus* by Smith from "Scotland, Mr. G. Don," are *R. plicatus*.

A German specimen named *R. plicatus* by Mr. Sonder of Hamburg is the same as our plant, to which also specimens named *R. suberectus* and *R. fastigiatus* by Dr. Weihe belong.

4. *R. fastigiatus* (W. et N. ?); *caule curvovo vel procumbente anguloso glabro, aculeis paucis rectis declinatis æqualibus in caulis angulis congestis, foliis quinato-digitatis planis, foliolo terminali cordato acuminato infimis subsessilibus intermediis incumbentibus, ramorum floriferorum lateralibus basi dilatatis, paniculæ subsimplicis foliosæ apice corymboso, sepalis a fructu reflexis.*

R. fastigiatus, *Rub. Germ.* 16. t. 2.?

Stems very long, but (I believe) not rooting. Prickles dilated

at the base, distant. Leaves green on both sides, pilose above, paler and downy beneath, flexible, large, unequally dentate-serrate. Petioles and midrib with strong hooked prickles. Panicle with few small straight declining prickles: floral leaves few simple cordate-ovate. Peduncles simple, elongate, ascending, downy with spreading hairs; lower ones distant axillary, upper corymbose; terminal peduncle much shorter than the others. Leaves of the flowering shoots ternate.

In dense woods at Jardine Hall in Dumfries-shire. August and September.

Obs. This plant so closely agrees with the figure and description of *R. fastigiatus* as given in the 'Rubi Germ.', that it is considered better to retain that name for it. It differs chiefly by having its lower leaflets nearly sessile and overlapping the intermediate pair, and the almost exactly dentate margin of its leaves.

5. *R. nitidus* (W. et N.); *caule suberecto anguloso lèvi nitido*, aculeis conicis rectis declinatis basi dilatatis, *foliis* quinato-digitatis *planis* supra nitidis subtus viridibus pubescentibusque, foliolo terminali ovato rotundatove *infinis* *pedicellatis intermediis dissitis*, *paniculae composite foliosæ* ramis patentibus divaricatisve: rachi polita superne pilosa.

R. nitidus, *Rub. Germ.* 19. t. 4.

Stem not arching, but producing a pendulous shoot in the autumn, glabrous or with a few scattered hairs. Terminal leaflet usually ovate; all sharply and irregularly serrate. Petioles with short, generally numerous, hooked prickles. Panicle very prickly, its branches usually spreading nearly at right angles to the rachis.

Hedges and thickets. July and August.

Obs. 1. "This plant is remarkable for the bright varnished appearance" of its stem, as well observed by Dr. T. B. Salter (Phyt. ii. 102). These stems are very frequently only suberect, but in some cases a slender pendulous shoot is produced which reaches the ground and roots. The flowering-shoots are nearly glabrous throughout the greater part of their length, but become gradually more and more covered with patent hairs as the extremity of the panicle is approached, between which the shining cuticle is seen.

Obs. 2. The panicle is here considerably different from that of all the preceding species. It is much more compound, irregular, and often rather close, nor do any of our specimens quite accord with the figure in 'Rub. Germ.' of this part. A specimen from Dr. Weihe has a less prickly panicle than the English plant.

*** *Caules arcuati vel procumbentes, radicantes, nunquam asperi, setis nullis* (sæpe in caulis junioribus, in maturis rarius, inven-

niuntur setæ sparsæ). Aculei in caulis angulis sèpissime congesti, subæquals.

6. *R. Salteri* (n. sp.) ; caule procumbente anguloso sulcato parce piloso, aculeis æqualibus parvis rectis declinatis, foliis quinatis, foliolis ovalibus apiculatis pilosis subtus tomentosis, *infimis breviter pedicellatis intermediis dissitis, panicula angustæ inferne foliosæ pubescentis ramis brevibus divaricatis simplicibus corymbosive, sepalis fructui oblongo adpressis.*

Stem long, decumbent, angular, striated, furrowed, green, with scattered short patent hairs ; prickles few, moderately long from a thick base, straight, declining, nearly equal, confined to the angles of the stem, slightly pilose. Leaves quinate-pedate ; stipules linear-lanceolate ; petioles and midribs with a few small strong declining or deflexed prickles ; leaflets strongly and doubly dentate-serrate in their upper half, the serratures simple and decreasing downwards ; terminal leaflet oval, shortly pointed, subcordate and slightly narrowed below ; lateral obovate, pointed, narrowed below ; basal oblong, not overlapping the lateral leaflets. Flowering-shoot long, pubescent with lax hairs ; prickles few, moderate, deflexed ; leaves ternate, green beneath ; petioles and midribs with few small deflexed prickles ; terminal leaflet obovate-oblong, rather abrupt, jagged at the end. Stipules linear-lanceolate. Panicle narrow, compound, pubescent with lax hairs, not setose ; prickles few, short, slightly deflexed ; two or three lower branches axillary from ternate or 3-lobed or simply ovate leaves, often elongated and patent ; the other branches short and patent, simple or 2-3-flowered ; terminal flower sessile ; lower bracts foliaceous, upper ones trifid. Sepals woolly, ovate, closely embracing the oblong black fruit. Petals lanceolate, narrowed below.

Apse Castle Wood, Isle of Wight, *Dr. Bell Salter*. July and August.

Obs. 1. This is a very straggling plant, prostrate unless supported by the neighbouring bushes or much shaded by trees. It is remarkably distinct in appearance from all its allies.

Obs. 2. A plant found by the river-side above Cramond Bridge near Edinburgh probably belongs to the same species, but it has its terminal leaflets cordate-acute, a short panicle with fewer hairs and smaller and more numerous prickles, subquinate intermediate leaves, and stipules slightly more broadly ovate ; its fruit and the direction of the calyx are unknown ; its petals are shortly ovate and clawed. A plant submitted to Dr. Bell Salter from Bradbury Wood, Cheshire, by Mr. Sidebotham, he considers to be identical with the plant of Cramond, but as with it, the direction of the calyx *when in fruit* is not ascertained. In Mr. Sidebotham's plant the panicle is somewhat larger and more branched, by

which it more nearly approaches the Isle of Wight or typical plant, while the prickles of that part are somewhat larger. A suberect form, similar to that noticed below (*Obs. 3.*), was sent with it from the same place. Another plant, kindly sent to me by the Rev. A. Bloxam, by whom it was gathered near Twycross, Leicestershire, in company with Mr. E. Lees, and named by the latter gentleman "*R. amplificatus* (Lees)," is also a probable variety of *R. Salteri*. It differs from the typical specimens by having linear stipules; the petioles and midribs with more numerous and stronger prickles; the flowering-shoot with much stronger and more numerous hooked prickles, and leaves ashy beneath; panicle with rather numerous and very strong hooked prickles, its branches nearly all axillary short few-flowered corymbose from ternate leaves, the uppermost leaf simple lanceolate; end of the panicle leafless, corymbose, terminal flower shortly stalked; the fruit smaller with a patent (?) calyx. This plant does not agree with specimens of *R. amplificatus* received from Mr. Lees himself, which are very nearly allied to *R. macrophyllus*.

Obs. 3. A form of this plant occurs in Apse Castle Wood, in a dense shade, similar to that mentioned by Dr. Bell Salter as his $\beta.$ *frustratus* of *R. Wahlbergii* (*Ann. Nat. Hist.* xvi. 371); it is suberect with flaccid leaves and abortive flowers. This is a state of arrested development. He is of opinion that this state of the plants should be considered as a recognised variety, for the reason that it is a permanent form, he having noticed it unchanged in the same situation for many years. Its identity with the fully-developed form described above is proved, not merely by transition states, but by a plant of the erect and abortive form having acquired the normal condition since it has been removed into a garden. A similar state is found in *R. discolor* in more exposed places. I observed this latter plant in that state on ditch-banks near Cambridge in the autumn of 1845.

7. *R. tenuis* (Bell Salt. !); caule procumbente tereti glabro, *aculeis deflexis* æqualibus validis, *foliis ternatis* rarius quinatis subglabris *subtus viridibus pubescentibusque*, foliolo terminali obovato-acuminato, panicula decomposita, *sepalis lanceolato-acuminatis* fructui parvo (nigro) drupeolis paucis magnis composito *adpressis*.

R. tenuis, Bell Salt. in *Ann. Nat. Hist.* xv. 305.

R. affinis δ , Rub. Germ. t. 3 b.

$\beta.$ *ferox* (Bell Salt. !); *aculeis crebris uncinatis*.

Whole plant much resembling *R. cæsius*, from which it differs by its stout equal and not straight prickles and total want of hairs and setæ on the barren stems, and the stronger prickles on its panicle. From *R. corylifolius* it may be known by the strongly

hooked prickles on its petioles, almost constantly ternate leaves, and longer and adpressed sepals.

South of England. July and August.

8. *R. corylifolius* (Sm. !); caule decurvo vel procumbente teretiusculo glabro, *aculeis conicis rectis tenuibus, foliis quinatis planis marginem versus undulatis subcoriaceis subitus mollibus canisque, foliolo terminali rotundato-ovato cordatove, infimis subsessilibus intermediis incumbentibus, panicula subcorymbosa, sepalis ovatis a fructu reflexis.*

R. corylifolius, Sm. Fl. Br. 542; Eng. Bot. 827; Arrh. Rub. Suec. 16; Bab. Man. 95.

R. affinis, Bab. Man. 93.

Stems long, usually glabrous. Prickles moderate, those of the petioles nearly straight. Lower branches of the panicle often elongated and spreading. "Torus roundish-clavate." Fruit sometimes rather hairy.

Hedges and thickets, common. July and August.

Obs. 1. I am now quite convinced that the common English plant is not *R. affinis* (W. and N.), and also that it is the *R. corylifolius* (Sm.), and have therefore removed the former name from our list and employed Smith's nomenclature. The *R. affinis* (W. and N.) appears to have its basal leaflets very decidedly stalked, the prickles of its barren shoot much stronger than in *R. corylifolius* and deflexed, and that shoot much more angular. In *R. corylifolius* the shoots might often be called round, never truly angular.

Obs. 2. Dr. Bell Salter noticed a plant at Selborne (Phyt. ii. 100) which he considers the typical plant of the *R. affinis* of the 'Rub. Germ.'; of this I possess only an imperfect specimen which does not seem to differ from the common form of this species, and certainly is not the *R. affinis* (W. and N.).

Obs. 3. Plants are occasionally found resembling, and probably referable to, *R. corylifolius*, which differ by having more angular stems and much stronger and deflexed prickles. I was once disposed to consider these as *R. affinis* (W. and N.), but their close similarity to *R. corylifolius* and the decidedly stalked basal leaflets of the plant figured in the 'Rub. Germ.' have caused a change in my views. It should however be observed that a specimen from Dr. Weihe himself (Reich. Fl. Germ. exsic. 781) has the lower pair of leaflets sessile, and that in some of our plants these leaflets are very manifestly stalked. In other cases the prickles on the rather angular stems are not deflexed but declining.

Obs. 4. The panicles of plants referable to this species often differ very remarkably, not in their real structure but in appear-

ance.. In some they are narrow, short and close ; in other cases the lower branches are very much elongated and spreading ; but all the intermediate forms may be found. The colour of the barren stem is usually purplish-green, but sometimes it is of a rather dark purple tint.

Obs. 5. Smith, in his first description of *R. corylifolius* (Fl. Br. ii. 542), says that the calyx is inflexed, and Woodward (With. Bot. Arr. ed. 3. ii. 470) says, "bent inwards and clasping the fruit." In his later works (Eng. Bot. 827; Eng. Fl. ii. 408) Smith corrects this, stating that it is reflexed. This will probably explain the difficulty which foreign botanists have found in determining Smith's plant; and the 'Fl. Brit.' being the work most frequently in their hands will account for their so generally referring *R. corylifolius* (Sm.) to *R. nemorosus* (Hayne), *R. dumetorum* (Weihe).

9. *R. cordifolius* (W. et N.); caule arcuato anguloso glabriusculo, aculeis validis rectiusculis horizontalibus declinatis, foliis quinatis coriaceis subtus tomentosis, foliolo terminali ovato vel subrotundo vel cordato-cuspidato, *infimis petiolatis intermediis dissitis, panicula composita hirta.*

R. cordifolius, *Rub. Germ.* 21. t. 5.

R. rhamnifolius, *Rub. Germ.* 22. t. 6; *Eng. Bot. Suppl.* t. 2604; *Bab. Man.* 93.

Stems many feet long, naked or slightly hairy. Leaflets variable in size, soft and green or whitish beneath; in some rare instances nearly or quite glabrous on both sides. Terminal leaflet cordate roundish cuspidate in *R. cordifolius*, ovate or roundish-ovate acute in *R. rhamnifolius* of the 'Rubi Germanici.' Panicle rather long; the lower branches often elongated and spreading, axillary; rachis downy. Petals roundish.

Common. July and August.

Obs. 1. I have willingly followed Mr. Borrer and many other recent observers in combining two plants of the 'Rubi Germ.', but adopted the above name (which stands first in the 'Rubi Germ.') in order to avoid the confusion attending the use of that of *R. rhamnifolius*. It is also the more appropriate.

Obs. 2. Plants are occasionally found which would, at sight, be referred to this species, but which from their nearly sessile lower leaflets overlapping the intermediate pair can hardly be joined with it. In some other respects they seem to occupy a place between this and the preceding species, to which they are the more nearly allied in technical character. One of these dubious specimens, from Islay, N. B., has the terminal leaflet of one of its leaves partially subdivided at the base, thus showing an approach to the suberect group : the same leaflet is also quite

abrupt at the end, closely resembling that of *R. discolor*, var. *abruptus*. Another, from near Midford Castle near Bath, is marked "agrees with a specimen of *R. rhamnifolius* from Nees in Mr. Borrer's herbarium exactly." Another from Crow Moele, Salop, is ticketed by Mr. Leighton "*R. rhamnifolius*, approaching *R. cordifolius*, Nees," on that author's authority. On table 6 of the 'Rubi Germ.' two plants are figured as *R. rhamnifolius* α . and β , the former with distinct lower leaflets, the latter with overlapping ones. No reference is made to these varieties in the text of that work, nor is anything said about this character. Mr. J. Adamson has given to me a specimen gathered near Gourock, Ayrshire, in which the leaves are thin and flexible with a convex upper surface. It is rather more hoary in appearance than is usual in this species, but seems to be referable to *R. cordifolius*.

10. *R. discolor* (W. et N.) ; caule arcuato anguloso s^epissime sulcato strigoso-sericeo, aculeis rectiusculis decurvatis horizontalibusve, foliis quinatis coriaceis tenuibus marginem versus decurvatis subtus albo-tomentosis, foliolo terminali obovato vel oblongo acuminate, panicula elongata angusta subaphylla tomentosa.

R. discolor, *Rub. Germ.* 46. t. 20.

R. fruticosus, *Eng. Bot.* 715 ; *Rub. Germ.* 24. t. 7.

Stem long, usually deeply furrowed. Prickles large, strong, numerous. Leaflets variable in shape, usually, in English plants, obovate and acute, sometimes (*R. abruptus*, Lindl.) cuneate-oblong, abruptly truncate and cuspidate. Panicle with patent branches, occasionally with long axillary ones below. Petals roundish-obovate.

β . *thyrsoides* (Bell Salt. !) ; caule subglabro, aculeis rectis, foliolis planis subtus molliusculis, paniculae plerumque breviusculis tomentosae ramis patentibus. *Phytol.* ii. 104.

γ . *macroacanthus* (Bell Salt. !) ; caule sericeo pilis paucis patentibus ornato, aculeis validis pilosis, foliolis planis subtus molliusculis, paniculae tomentosae ramis ascendentibus. *Ann. Nat. Hist.* xvi. 366.

R. macroacanthos, *Rub. Germ.* 44. t. 18.

δ . *argenteus* (Bell Salt. !) ; caule patente-piloso, aculeis rectis, foliolis planis subtus molliusculis, paniculae tomentosae ramis ascendentibus. *Ann. Nat. Hist.* xvi. 367.

" *R. argenteus*, *Rub. Germ.* t. 19."

Common. July and August.

Obs. 1. I have placed both the plants of the 'Rubi Germ.' under the type of this species, but neither of those plates exactly represents either of our plants. The narrow leaves of the *R. fruticosus* of that work agree well with the more common English plant, but then they are combined with a deeply furrowed gla-

brous barren shoot. In our plant this form of leaf is most usually found upon silky angular but scarcely furrowed shoots. Also the much rounder leaves of the *R. discolor* (Rubi Germ.) is an attendant upon a furrowed barren shoot and a thyrsoid panicle in this country.

Obs. 2. The panicle in *var. a.* and *β.* has a different appearance from that of *var. γ.* and *δ.* owing to its lower branches, although short, spreading at nearly a right angle from the rachis; in the later varieties they are usually rather longer, but ascend from a very acute angle with the rachis.

Obs. 3. Dr. Bell Salter has given to me a form of this plant under the manuscript name of *var. lærvis*, differing from the typical state in having its flowering shoot nearly without prickles. It seems hardly deserving of a distinctive name; it is probably the *var. inermis* of Godron. The *R. abruptus* (Lindl.) can only be considered as a state of the species, not a true variety. Such forms are found in many if not all the species.

Obs. 4. A *frustratus* form of this species occasionally may be observed. It is almost exactly suberect, showing no tendency to prolong its growing shoots so as to reach the ground, or indeed to do more than very slightly curve at the summit. In all other respects it resembles the typical plant.

11. *R. leucostachys* (Sm. !); *caule* arcuato anguloso *piloso-villoso*, *aculeis* *aequalibus* *rectiusculis* *horizontalibus*, *foliis* *quinatis* *coriaceis* *planis* *subtus* *mollibus* *fulvo-above-hirtis* *micantibus*, *foliolo* *terminali* *ovato* *rotundato* *abrupte* *apiculato*, *panicula* *elongata* *angusta* *foliosa* *villosa* *vel* *tomentosa*.

R. leucostachys, *Eng. Bot. Suppl.* 2631.

R. pubescens, *Rub. Germ.* 42. t. 16.

Stem long, not furrowed, often nearly round; *pubescence* *loose*, *weak*. Prickles numerous, hairy. Leaflets, particularly those of the flowering shoot, often wavy at the margins. Flowering shoot and panicle with numerous long straight prickles (in which respect it differs from the figure quoted above from the 'Rubi Germ.') and a few setæ; branches short, patent or divaricated.

β. vestitus (Bell Salt. !); *caule* *aestivo* *suberecto*, *foliolis* *subrotundis* *acutis* *mucronato-dentatis* *subtus* *pallide* *viridibus* *albidisve*. *Phytol.* ii. 105.

R. vestitus, *Rub. Germ.* 81. t. 33.

R. diversifolius, *Lindl. Syn. ed.* 1. 93.

R. villicaulis, *Leight. Fl. Shrop.* 231.

R. villicaulis a, *Bab. Man.* 95.

γ. argenteus (Bell Salt. !); *caulis* *pubescentia* *densa* *argenteaque*, *foliolo* *terminali* *subrotundo-ovato* *acuminato* *duplicato-dentato* *subtus* *albo* *sericeo* *micanteque*, *caulis* *paniculæque* *aculeis* *maxi-*

mis, paniculæ ramis inferioribus elongatis et erecto-patentibus.
Ann. Nat. Hist. xvi. 366.
R. villicaulis β , *Bab. Man.* 95.

Hedges and thickets. β . in shady places. γ . Channel Islands. Sussex and Isle of Wight, *Dr. Bell Salter*. July and August.

Obs. I fully concur with my friend Dr. Bell Salter in combining these three plants, although it would be difficult to believe that they are only varieties if the extreme forms alone were before us. The remarkably round leaflets and somewhat suberect habit of *R. vestitus*, and the branching corymbose and often very straggling panicle of *R. argenteus* would undoubtedly afford good distinguishing marks, did we not see numerous intermediate forms connecting both of them with the typical *R. leucostachys*.

12. *R. sylvaticus* (W. et N.); caule arcuato anguloso subteretive piloso, aculeis paulo inæqualibus tenuibus rectis, foliis quinatis subtus mollibus micantibus pallideque viridibus, foliolo terminali cordato-ovato apiculato, paniculæ compositæ foliosæ ramis brevibus.
R. sylvaticus, *Rub. Germ.* 41. t. 15.
R. villicaulis γ , *Bab. Man.* 95.

Stem not furrowed, often nearly round; *pubescence of shining patent nearly parallel hairs*. Prickles moderate, rather numerous, declining, hairy at their base, not quite confined to the angles. Leaflets *serrate*, usually tinged with purple on the veins beneath. Flowering shoot and panicle with short slender prickles and setæ usually sunk in the dense pubescence; floral leaves usually 3-fid or simple.

β . *villicaulis*; foliolo terminali ovali rotundatove cuspidato, paniculæ ramis longioribus: aculeis validioribus, caulis aculeis subæqualibus sparsis.
R. villicaulis, *Rub. Germ.* 43. t. 17.

Rather rare. Bath; Killarney; Loch Eil and Linlithgow.
 β . Isle of Wight and Dorset, *Dr. Bell Salter*. July and August.

Obs. The differences between the *R. sylvaticus* and *R. villicaulis* of the 'Rubi Germ.' do not seem to be more than those of varieties. The under side of the leaves of the latter is usually rather paler, but in all respects the characters between them are only those of degree. I take *R. sylvaticus* as the specific name from its standing first in that work, and also because *villicaulis* has been often misapplied in this country to *R. leucostachys* β .

13. *R. Borreri* (Bell Salt. !); caule procumbente tereti hirto, aculeis crebris inæqualibus longis tenuibus *deflexis*, foliis quinatis subtus hirtis concoloribus, foliolo terminali late obovato-lanceolato cuspidato, paniculæ corymbosæ ramis inferioribus longis decompositis

flore terminali subsessili, sepalis fructum hemisphaericum laxe amplectentibus.

R. Borreri, *Bell Salter in Ann. Nat. Hist.* xv. 306.

Stems mostly quite prostrate, very prickly; pubescence of patent hairs. Prickles not confined to the angles of the stem. Leaflets of the same colour on both sides. Flowering shoot and panicle with few short slender prickles, hairy and slightly setose. Sepals linear-lanceolate.

“*β. Wilsoni* (Bell Salt. MSS.); pilis in aciculoso paucos abeuntibus, aculeis ad basin latis.”

Apse Heath and Pagham Common, Isle of Wight, *Dr. Bell Salter*. *β.* Near Buglawton, Cheshire, *Mr. S. E. Wilson*. June.

14. *R. Sprengelii* (Weihe); caule procumbente tereti sparsim piloso, aculeis uncinatis, foliis ternatis, foliolis obovatis acuminatis concoloribus subitus venosis, paniculae ramosae tomentosae ramis divaricatis paucifloris, sepalis ovatis acuminatis dense tomentosis patentibus.

R. Sprengelii, *Rub. Germ.* 32. 10.

A low trailing plant with greenish purple stems, which are very slender and either simple or branched. Prickles purple, yellow-tipped, small and slender, and so extremely uncinate that the point is parallel with the stem. Hairs rigid, shining and patent, but not sufficiently numerous to produce the appearance of pubescence. Leaves *rarely* otherwise than ternate. Petioles armed as the stem, furrowed above. Leaflets obovate acuminate, irregularly but finely and acutely serrated, bright shining green above, with a few spreading hairs and the principal venations grooved, green and hairy beneath with very prominent veins, and the midrib armed with a few slender uncinate prickles. Terminal leaflet with its petiole geniculated, lateral leaflets broader externally and somewhat lobed. Stipules with small glands. *Panicle*—or rather flowering stem, as it grows erect from the last year's shoot apparently from the ground—in the lower part leafy and clothed nearly as the barren shoot, but the prickles somewhat smaller, and the hairs more numerous and longer. Leaves like those of the barren shoot but rather more hairy: upper or floral portion branched. Branches rather distant, slender and few—(about three-) flowered and spreading; one or two lower ones axillary from ternate leaves, which towards the summit pass into leafy bracts. Peduncles and calyx very hairy, with shining patent hairs interspersed with shaggy pubescence. Petals ovate, obtuse, rugose, of a very beautiful rose-pink. Stamens erect.

Bredbury Wood, Cheshire, plentifully, *Mr. Joseph Sidebotham*. Near Congleton, Cheshire, *Mr. S. E. Wilson*.

Obs. 1. Our English plant has both the prickles and petals

slightly more elongated than represented in the 'Rubi Germanici.' In other respects both the figure and description in that work represent ours most faithfully.

Obs. 2. This is one of the most beautiful as well as most distinct of our *Rubi*, and is a highly interesting addition to our flora. *R. Sprengelii*, with its concealed branched and creeping barren shoot, and its erect delicate flowering stem growing apparently from the ground, approaches most nearly in appearance to the herbaceous forms, but in appearance only, as it is, though small, weak and trailing, one of the true fruticose species, its panicles in reality emanating from a biennial shoot. In the general form of the leaf and leaflets it very much resembles *R. glandulosus* (particularly the *var. rosaceus*), as also in having the terminal leaflet articulated; in the grooving of the veins above and their prominence beneath it resembles *R. Radula*, while the midrib approaches the carinated aspect of that part in the *var. carinatus* of *R. plicatus*.

The delicately slender wire-like branches and peduncles, and the beautifully bright tint of its flowers, formed of reticulated or rugose-plicate petals, render this plant remarkably beautiful.

Obs. 3. The two kinds of hairiness on the peduncles of this plant are very striking: it is like the patent, parallel villosity of *R. sylvaticus*, combined with the shaggy hairiness, spreading in all directions, of *R. leucostachys*. The shining rigid patent hairs may be seen protruding through the tomentum.

N.B. I am indebted for the above character, description and observations to Dr. Bell Salter, as I have seen no native specimens of *R. Sprengelii*.

15. *R. Leightonianus* (n. sp.); caule arcuato subanguloso hirto, aculeis paulo inæqualibus rectis paulo declinatis, foliis quinatis ternatis duplicato-apiculato-dentatis supra pilosis subtus pallide viridibus hirtisque, foliolo terminali rotundato acuto, paniculæ inferne foliosæ densissime hirsutæ setosæ ramis brevibus paucifloris divaricatis.

R. villicaulis ð. *tenuis*, *Bab. Man.* 95.

R. dentatus, *Bab. in literis ad amicos*.

Stem long, arched, slightly angular, hairy; prickles rather numerous and unequal, not confined to the angles of the stem, straight, yellow tinged with purple, subulate from a dilated hairy base; setæ and aciculi wanting; hairs numerous, scattered, slender, spreading, white. Leaves quinate-pedate or ternate by the junction of the lateral pairs, thin; terminal leaflet nearly round, acute, slightly emarginate at the base, doubly and coarsely dentate-crenate-apiculate, except towards the base, which is distantly serrate; intermediate leaflets obovate-acute; lowermost

when distinct shortly stalked, oval, acute; all thin, dark green and pilose above, light green with much more conspicuous hairs, especially on the ribs, beneath; petioles and pedicels very hairy and with scattered straight slender strongly declining yellow prickles with a purple base; stipules linear-lanceolate hairy. Flowering shoot and panicle very hairy; prickles slender, straight, declining, yellow tinged with purple at the base. Leaves ternate; leaflets large, oval, acute, finely and nearly regularly dentate-apiculate. Panicle and its branches with numerous setæ which are shorter than the hairs and hidden by them; about three lower branches from the axils of the leaves, the rest, about eight, subtended by trifid slender very hairy bracts, all spreading nearly at right angles to the rachis and bearing a corymb of three or four flowers, the uppermost are 1-flowered; the lower ones about two inches long, the others shortening upwards. Sepals acuminate, densely woolly on both sides, with long hairs and a few short setæ interspersed.

Gathered at Haughmont, Salop, in September 1837, in company with my friend the Rev. W. A. Leighton, author of the justly valued 'Flora of Shropshire.' I have named the plant in his honour, being obliged to place the *R. Leightoni* (Lees) as a variety of *R. rufis*, and wishing to retain his name attached to a species in a genus to the elucidation of which he has so successfully devoted his talents. I also found it at Alborne, Sussex, in 1845.

Obs. The peculiar toothing of the leaves is a characteristic point of great value, very few species being so distinguished. *R. Babingtonii* in the glandulose group is a similar and almost solitary case.

16. *R. carpinifolius* (W. et N.); *caule ascendente subanguloso hirto, aculeis validis deflexis declinatisve, foliis quinatis coriaceis acute serratis subitus viridis, foliolo terminali ovato angusto acuminato, infimis intermediis dissitis, paniculæ angustæ valde hirsutæ ramis ascendentibus.*

R. carpinifolius, *Rub. Germ.* 36. t. 13; *Eng. Bot. Suppl.* 2664.

Stem suberect, ultimately arching, clothed with fascicles of straight spreading hairs, angular when young. Prickles numerous, of moderate size, equal, hairy, tipped with yellow. Leaflets slightly hairy above, more so and paler beneath. Panicle prickly, compact, often slightly setose, usually with short ascending few-flowered branches, or with a simple close panicle. Flowers and fruit contemporaneous.

Hedges, rare. July to September.

Obs. 1. It has been well observed by Dr. Bell Salter, that the mode of growth of the barren shoot of this species is very similar

to that observed in *R. nitidus*. In the present case the autumnal secondary growth more generally takes place, but during the summer months it is truly suberect. The young shoots are usually angular, but the matured wood seldom shows much trace of the angles.

Obs. 2. A variety with rose-coloured flowers, flaccid leaves and more angular stem is noticed in the 'Rubi Germ.' and mentioned as "an extremely beautiful" plant by Dr. Salter, who also observes that this form has a few scattered glands in the panicle.

17. *R. macrophyllus* (W. et N.); caule arcuato anguloso hirto, *aculeis paucis parvis rectis æqualibus, foliis quinatis mucronato-serratis subtus pallide viridibus pubescentibusque, foliolo terminali elliptico-ovato, infimis petiolatis intermediis dissitis, panicula compositæ elongato-corymbosæ ramis ascendentibus.*

R. macrophyllus, *Rub. Germ.* 35. t. 12; *Eng. Bot. Suppl.* 2625.

Stem long, purplish, more or less hairy or nearly glabrous. Prickles short, thick at the base, distant. Leaflets irregularly but doubly serrate, acute, or with a long point, downy or distantly pilose beneath. Prickles on the panicle small.

β . *Schlechtendalii* (Bab.); foliolo terminali obovato-cuneato cuspido irregulariter duplicato-serrato, aculeis majoribus. *Bab. Man.* 95.

R. Schlechtendalii, *Rub. Germ.* 34. t. 11.

γ . *amplificatus*; foliolo terminali ut in var. β . sed sæpe subtus pallido, paniculæ longissimæ angustæ inferne foliosæ ramis erecto-ascendentibus: pubescens flavescente.

R. amplificatus, *Lees MSS.* !

Hedges and thickets, rare. July and August.

Obs. 1. These plants are usually quite without setæ on the barren shoot, but even on English specimens I believe that a very few may occasionally be detected. On Irish (Killarney) specimens of the typical variety short setæ are moderately abundant, and a very few extremely short aciculi may also be found: some of these specimens have almost glabrous barren shoots. We thus see an approach to the species included in the next section.

Obs. 2. Mr. Lees has favoured me with fine specimens of his *R. amplificatus*. It presents a different appearance from *R. macrophyllus*, but I fear that it must be considered as a variety of that species. Its chief difference is found in the panicle, which is very much longer, and has rather long axillary branches below, which form a very acute angle with the rachis when the plant is in flower, but afterwards appear to become much more spreading. The prickles on the panicle are usually much stronger, and the dense pubescence is beautifully tinged with yellow. One of the specimens has an enormous panicle, each lower branch of

which has the same structure as that which is usual to the whole inflorescence.

*** *Caules arcuati vel procumbentes, radicantes, angulosi, hirti, setosi.*

† *Caules punctis elevatis rigidis, ubi setæ et aciculi sederunt, asperi efficiuntur. Aculei subæquales, in caulis angulis sæpiissime congesti.*

18. *R. Babingtonii* (Bell Salt. !); *caule* arcuato tereti sulcato vel anguloso lateribus planis striatis aspero, aculeis brevibus declinatis, setis aciculisque multis brevibus, *foliis ternatis quinatis mucronato-crenato-dentatis* pilosis opacis *subtus parce pubescentibus pallide viridibus* foliolis obovato-orbiculatis abrupte cuspidatis, *paniculae* composite longæ tomentosæ aculeatæ setosæ *ramis omnibus e foliolorum axillis, sepalis ovato-lanceolatis aciculatis setosis tomentosis a fructu laxe reflexis.*

a. *verus*; *caule* tereti sulcato, aculeis validis, paniculæ ramis racemosis.

R. Babingtonii, Bell Salt. in Ann. Nat. Hist. xv. 307.

A very large stout plant of peculiar appearance. Stem greenish purple, rounded and sulcate, with very short thick-based prickles and numerous aciculi and setæ of the same form. Leaves dark green with a few scattered hairs above, paler green with rather more numerous short hairs beneath, ternate or occasionally quinate by the subdivision of the lateral leaflets, in which case the lower leaflets are stalked. Petioles armed like the stem. Stipules linear, membranaceous, hairy and sparingly glandulose. Panicle more than three feet long, with large branches forming secondary panicles. Rachis, branches, peduncles and petioles with numerous long slender straight declining yellow prickles with broad purple bases, numerous hairs and small aciculi and unequal setæ. Floral leaves very large; lower ones ternate or quinate; upper ones simple, ovate-acuminate, lobed. Sepals yellowish, with a prominent midrib which is lengthened into an acuminate point. Fruit small and composed of small drupes.

β. Bloxamii; *caule* anguloso lateribus planis striatis, aculeis parvis, aciculis setisque brevissimis, paniculæ ramis brevibus paucifloris corymbosis.

Week Hill, Selborne, Hampshire, *Dr. Bell Salter*. Cowleigh Park near Great Malvern, Worcestershire, *Mr. E. Lees*. *β.* Very abundant in a lane by Hartshill Wood, Warwickshire, but on the opposite side from the wood, *Rev. A. Bloxam*. July.

Obs. 1. In some respects this plant approaches *R. thyrsiflorus* (Weihe), but in that the greater part of the panicle is extrafoliaceous, in this it is leafy to the end. From *R. Kæhleri*, to which it has some points of resemblance, it is separated by the

sectional characters. From the three following species it is abundantly distinguished by its stout aciculi and setæ, usually ternate leaves and large floral leaves. The dentate-apiculate margin of its leaves distinguishes it from all the British species except *R. Leightonianus*, with which however it cannot be confounded, that not being a glandulose plant.

Obs. 2. The var. β . *Bloxamii* has a panicle of very different aspect from that of the typical *R. Babingtonii*, the branches being short and distinctly corymbose, the floral leaves larger, especially towards the summit of the panicle, and more usually pilose. The prickles of the growing shoot are neither so numerous nor so strong, the setæ and aciculi are very short and more equal, the hairs much more numerous; the leaves more frequently quinate. In one instance the terminal leaflet of a ternate leaf is subdividing at its base as in *R. suberectus*, so as to form a partially pinnate leaf.

19. *R. rудis* (Weihe); caule arcuato procumbenteve paululum sulcato aspero, aculeis subæqualibus validis declinatis in caulis angulis permulto locatis aciculis setis pilisque æqualibus multo longioribus, foliis quinatis grosse duplicato-serratis subtus albis, paniculae longæ foliosæ superne ultra-axillaris ramis corymbosis ascendentibus, sepalis lanceolatis aciculatis setosis a fructu reflexis petioloque adpressis.

R. rудis, *Bell Salter in Ann. Nat. Hist.* xvi. 367.

Stem dark fuscous. Prickles not passing into the aciculi or setæ. Leaves dark green above; lower pair of leaflets stalked. Panicle much-branched; prickles long, slender and nearly horizontal; rachis usually very setose. Sepals generally ending in a foliaceous point, clothed with dark setæ.

a. rудis; foliolo terminali obovato-lanceolato.

R. rудis, *Rub. Germ.* 91. t. 40.

R. Radula, *Leight. Fl. Shrop.* 232.

R. Radula γ . *Hystrix*, *Bab. Man.* 96.

β. Leightonii (Bell Salt. !); foliolo terminali rotundato-ovato abrupte cuspidato. *Ann. Nat. Hist.* xvi. 367.

R. Leightonii, *Lees in Leight. Fl. Shrop.* 233.

γ. Reichenbachii (Bell Salt. !); foliolo terminali subrotundo, caule hirsuto aciculis setisque paucis. *Ann. Nat. Hist.* xvi. 368.

R. Reichenbachii, *Rub. Germ.* 87. t. 37.

δ. attenuatus; foliolo terminali obovato longissime acuminato subtus pallide viridi.

R. echinatus, *Bab. Man.* 96. not. *Lindl.*

Hedges in the south. β . Shropshire; γ . Isle of Wight, *Dr. Bell Salter*; δ . Somersetshire, Shropshire and Leicestershire. July.

Obs. 1. After much consideration I have formed the same opinion as Dr. Bell Salter upon this and the following species. The usually very setose rachis of the much-branched panicle, and the coarsely serrate and even jagged leaves distinguish this plant from the following, although occasionally one or the other character is wanting. In *var. β.* the leaves are usually rather finely but yet irregularly serrate, and in some forms of *var. α.* the rachis has a few setæ. In all the forms the sepals are very strongly reflexed from the fruit, and even closely adpressed to the peduncle; they are also clothed with numerous dark setæ and have generally a leafy point.

Obs. 2. The *vars. γ.* and *δ.* have very much the appearance of being distinct species, and would be so considered did not intermediate states occur. *Var. δ.* is remarkable for having its leaflets gradually narrowed into a long jagged point, the base being occasionally narrowed in a similar manner. An incorrectly named, and supposed authentic specimen caused me formerly to consider this as *R. echinatus* (Lindl.), which I have now ascertained to belong to *R. fusco-ater* of Weihe.

Obs. 3. A Silesian specimen named *R. Kœhleri* from Grabowski, one of the authors of the excellent 'Fl. Silesiæ,' does not agree with the description in that work, and appears to be a much less prickly form of my *var. attenuatus* of the present species.

20. *R. Radula* (Weihe); caule arcuato procumbente anguloso aspero, aculeis inaequalibus tenuibus basi dilatatis sparsis aciculos et setas pilosque inaequales crebros longe excedentibus, *foliis* quinatis inaequaliter *argute serratis*, foliolis acuminatis, paniculæ longæ foliosæ superne ultra-axillaris ramis brevibus corymbosis, sepalis ovatis tomentosis a fructu laxe reflexis.

R. Radula, *Bell Salter in Ann. Nat. Hist.* xvi. 367.

Stem green or greenish purple. Prickles mostly large, but a few smaller passing insensibly into aciculi. Leaves dark green above, paler beneath; lower pair of leaflets stalked. Panicle slightly branched, the branches usually short and with few flowers or even 1-flowered; prickles slender; rachis rather sparingly setose. Sepals without any leafy point, clothed with a whitish tomentum and a few setæ.

α. Radula; caule valde setoso pilis paucis, foliis glabris superne venis impressis subtus albo-viridibus pubescentibusque, foliolo terminali ovato acuminato.

R. Radula, *Rub. Germ.* 89. t. 39.

R. Radula β. rudis, *Bab. Man.* 96.

β. Hystrix (Bell Salt. !); caule pauci-setoso, foliis pilis sparsis venisque paulo impressis subtus subhirtis, foliolo terminali inferne attenuato. *Ann. Nat. Hist.* xvi. 369.

R. Hystrix, *Rub. Germ.* 92. t. 41.

γ. pygmæus (Bell Salt. !); caule tereti, aculeis aciculis setis pilisque multis, foliis pilis sparsis subtus viridibus tomentosis; foliolo terminali obovato-acuminato: petiolo aculeis multis inæqualibus paullum decurvatis aciculisque brevibus validis armato. *Ann. Nat. Hist.* xvi. 369.

R. pygmæus, *Rub. Germ.* 93. t. 42.

δ. foliosus (Bell Salt. !); caule subanguloso, aciculis setis pilisque brevissimis, foliis pilis sparsis subtus viridi-albis tomentosis, foliolo terminali ovato-acuminato: petiolo aculeis multis inæqualibus paullum decurvatis aciculisque brevibus validis armato. *Ann. Nat. Hist.* xvi. 369.

R. foliosus, *Rub. Germ.* 74. t. 28.

Hedges and thickets. *a.* Dumfries-shire; Edinburghshire; Dorset. *β.* Sussex; Isle of Wight. *γ.* Renfrewshire; near Bristol. *δ.* Glen Falloch, N. B. July and August.

Obs. 1. The paler tint of the stem, much less strongly toothed leaves and closer panicle appear to distinguish all the above forms, which Dr. Bell Salter has combined under the name of *R. Radula*, from the *R. rufa*. Here also the prickles are not so nearly equal, although the larger ones are usually almost equal, and greatly exceed in size the under series which gradually merges in short very thick aciculi and setæ.

Obs. 2. The partial and general petioles, and also the midrib of the leaves on the barren stems, are furnished with moderately numerous rather slender but short hooked prickles, with a very few short rigid points interspersed: but in the less frequent forms referred above to *R. pygmæus* and *R. foliosus* of the German botanists, these rigid points become very numerous, and together with the prickles vary so much in size as to merge insensibly into each other.

Obs. 3. The plant referred above to *R. foliosus* (Weihe) differs slightly from the figure and description in the 'Rubi Germ.' Its panicle is not leafy to the summit, but the upper branches are subtended by trifid bracts. It agrees so well in most other respects and in general appearance with that plate, that I have very little doubt of its claims to the name of *R. foliosus*.

21. *R. Lingua* (Weihe); caule procumbente arcuatove subanguloso aspero, aculeis inæqualibus subrectis declinatis, aciculis setis pilisque paucis brevibus, foliis quinatis ternatisve subglabris subtus pallide viridibus albidisve hirtis, foliolo terminali ovato abrupte cuspidato, *panicula laxæ ramis sæpissime unifloris*, foliis floralibus simplicibus magnis, sepalis ovatis tomentosis cuspidatis a fructu laxæ reflexis.

R. Lingua, *Rubi Germ.* 88. t. 38.

Stem green or greenish purple. Prickles not very numerous, moderate, purplish yellow, fewer than in the preceding species and

less decidedly larger than the aciculi. Leaves usually green on both sides; terminal leaflet generally remarkably abrupt, lower pair stalked. *Panicle nearly simple with very long pedicels* or 2—3-flowered branches, leafy below; lower floral leaves ternate, upper simple; rachis and branches clothed with an ashy tomentum, short setæ and slender purplish prickles. Calyx greenish.

β. tomentosus; foliolo terminali acuminato subtus tomentoso albido-cinerascente, paniculae ramis corymbosis subtrifloris.

R. scaber, *Rub. Germ.* t. 32?

Oakhampton, Devon; Jardine Hall, Dumfries-shire. *β. Jersey*. Poole, Dorset, *Dr. Bell Salter*. July to September.

Obs. 1. The Oakhampton plant agrees very exactly with the plate in the 'Rubi Germ.' In it one or two of the lowermost branches of the panicle have more than one flower, the others being reduced to a single flower, which thus appears to be provided with a peduncle of at least an inch in length. The Dumfries-shire specimens only differ by having these branches all very much shorter so as to give a close appearance to the panicle. In this latter plant the flowers and fruit are contemporaneous.

Obs. 2. The var. *β. tomentosus* has the general appearance of *R. scaber* (Weihe) as represented in the 'Rubi Germ.', but that plant has much smaller and more decidedly hooked prickles on its barren stem, and the under side of all its leaves pale green and only slightly pubescent. It probably is a state of this species.

It seems doubtful, as suggested by Dr. Salter, if *R. Lingua* will not ultimately be shown to be a form of *R. Radula*.

†† Aculei inæquales, sparsi, in aciculos setasque adeuntibus.

22. *R. fusco-ater* (Weihe); caule decumbente anguloso sparsim piloso setoso, aculeis multis inæqualibus rectis, foliis quinatis opacis subtus pallidis mollibus nitidis sericeis, foliolo terminali cordato-ovato acuminato undulato, infinis intermediis incumbentibus, paniculae inferne foliosæ setosæ ramis corymbosis.

R. fusco-ater, *Rub. Germ.* 72. t. 26.

R. Radula (*Lindl.*), *Leight.*!

Barren stem with numerous rather unequal moderately large prickles, and more or less numerous unequal smaller ones connecting them with the small aciculi and the setæ. Petioles with strong declining or deflexed prickles, lower leaflets (in our plant) nearly or quite sessile, terminal leaflet rather broad at the base, all pale green beneath. Panicle clothed with numerous short hairs and setæ and long and strong prickles. Calyx patent or loosely reflexed from the fruit.

β. candicans; caulis petiolorumque aculeis paucioribus pilis numero-

sioribus, foliis subtus albis, foliolo terminali rotunde obovato, infimis petiolatis, panicula hirsuta.

R. Radula, *Lees MSS.* !

γ. echinatus ; caulis petiolorumque aculeis multis, foliis concoloribus subtus duris rigide pilosis, foliolo terminali obovato, infimis petiolatis, paniculae pilis longis setis aciculisque longioribus aculeis crebris minimis tenuibus.

R. *echinatus*, *Lindl. ! Syn. ed. 1. 94* ; *Leight. ! Fl. Shrop. 235. not Bab.*

Isle of Wight and Dorset, *Dr. Bell Salter* ; Shropshire ; Leicestershire, *Rev. A. Bloxam*. β . Little Malvern, Worcestershire, *Mr. E. Lees*. γ . Almond Park, Salop. July and August.

Obs. 1. I have received from my friend the Rev. W. H. Coleman a plant gathered in Mangrove Lane, Hertford, which appears to be referable to the type of this species. Its leaves are almost exactly cordate and cuspidate, glabrous above, very finely tomentose beneath ; the petioles have fewer prickles. The barren shoot has scarcely any hairs, few setæ, very few and short aciculi ; its prickles are rather numerous and mostly large and equal, but there are a few very unequal and smaller. Another plant sent to me by Mr. F. Adamson, who states that it is "not uncommon near Gourock" in Renfrewshire, has fewer large prickles on its barren shoots than Mr. Coleman's plant, and about the same amount of setæ, aciculi and hairs ; its petioles and flowering shoot are armed in the manner usual to the species. These plants are very nearly allied to those included in the preceding section, and might without much impropriety be placed in it ; but they are so closely connected by intermediate forms with the type of *R. fusco-ater*, and that through the *var. echinatus* with *R. Kähleri*, that I feel confident that this is their true position. Indeed the armature of the barren shoots, if carefully examined, will be found to be rather that of this section than of the preceding.

23. *R. Kähleri* (Weihe) ; caule decurvato procumbente hirto setoso, aculeis multis validis inæqualibus sepissime rectis, foliis quinatis opacis subtus hirtis mollibus, foliolo terminali obovato vel elliptico acuminato, infimis intermediis dissitis, panicula ramosa inferne foliosa spinosa setosa, sepalis patentibus fructuue reflexis.

α. Kähleri ; aculeis permultis inæqualibus rectis paulo declinatis, pilis paucis, foliolo terminali obovato acuminato, paniculae superne tomentosæ ramis corymbosis patentibus aculeis multis longis rectis.

R. *Köhleri*, *Rubi Germ. 71. t. 25* ; *Eng. Bot. Suppl. 2605*.

The surface of the barren stem is almost covered by the very unequal prickles, aciculi and setæ. Leaves pale green beneath, coarsely serrate ; general and partial stalks and midrib beneath very prickly ; stipules linear. In a subvariety the leaves have

fewer prickles on their midrib and stalks and linear-lanceolate stipules; its barren stem is rather less prickly. In another form the prickles on the panicle are rather hooked.

β. cuspidatus; aculeis brevibus rectis horizontalibus, pilis paucis, *foliolo terminali obovato cuspidato*, paniculæ superne tomentosæ, ramis corymbosis brevibus patentibus setis multis aculeis paucioribus brevibus rectis.

R. glandulosus, *Sm. ! Eng. Fl.* ii. 403. *exc. syn.*

I do not find a figure of this plant in the 'Rubi Germanici.' Its aspect is considerably different from the typical *R. Kœhleri*, and it may be known by its cuspidate leaves, which are usually deeply inciso-serrate at the end, and the fewer and shorter prickles throughout. I believe this to be the *R. apiculatus* from Beeston Castle referred to by Dr. Salter (Phytol. ii. 132). In some forms of this plant the leaves are very much truncated, and in a specimen from Killarney, quite abrupt like those of *R. Lingua*.

γ. pallidus; aculeis tenuibus rectis declinatis, pilis multis, *foliolo terminali obovato-elliptico acuminato*, paniculæ superne subtomentosæ ramis racemoso-corymbosis setis multis *aculeis multis brevibus validis declinatis deflexive*.

R. pallidus, *Rub. Germ.* 75. t. 29.

When the leaves are ternate, as occasionally occurs, this is almost exactly *R. apiculatus* (Weihe), 'Rub. Germ.' t. 24, in which the leaves are sometimes quinate, and are so represented on that plate; but the leaves of our plant are not "pubescenti-albida" on the under side.

δ. infestus; *aculeis multis validis brevibus valde declinatis*, pilis setis aciculisque brevissimis paucis, *foliolo terminali oblongo-acuminato* subtus pallide viridi tomentoso, paniculæ oblongæ ramis brevibus paucifloris *aculeis multis longis tenuibus declinatis*.

The short declining or even hooked prickles with very thick bases are characteristic of this plant. Its panicle is nearly simple, with a few simple floral leaves below and lanceolate or trifid bracts in its upper part. It differs slightly from *R. infestus* (Weihe), 'Rub. Germ.' t. 30, which has roundish-cordate leaflets and shorter prickles on the panicle.

ε. fuscus; *aculeis paucioribus declinatis, aciculis setis pilisque multis, foliolo terminali elliptico subcordato cuspidato*, paniculæ angustæ ramis brevibus paucifloris corymbosis *aculeis brevibus tenuibus*.

R. fuscus, *Rubi Germ.* 73. t. 27.

R. fusco-ater (*Lindl.*), *Leight. Fl. Shrop.* 235.

R. Kœhleri β. *fusco-ater*, *Bab. Man.* 97.

The panicle of this plant is usually furnished with numerous long unequal setæ standing prominently out from its hairy co-

vering ; but in a plant from Bearhaven, co. Cork, which seems referable to this variety, the setæ on that part are almost altogether wanting, and the few that exist are hidden in the dense hairy coat.

Very common. β . Rydal Woods, Westmoreland, *Mr. Borrer* ; Dumfries-shire ; Durham ; Killarney. γ . Near Bath ; Stock Gill near Ambleside, *Mr. Borrer* ; Worcestershire, *Mr. Lees*. Near Ware, Herts, *Rev. W. H. Coleman*. δ . Killarney. July and August.

Obs. 1. The several plants which I have now included under the name of *R. Kähleri* have all been considered as distinct species by high authorities. I firmly believe that they are so connected together by intermediate forms as to constitute but one species. It is often difficult to determine under which of the named forms some specimens should be ranged. They are all well marked by the numerous strong and very unequal prickles on the barren shoots, of which the smaller so merge in aciculi and stiff aciculiform setæ, those in true setæ and these last in hairs, that it is impossible to say where one of those forms of armature begins and another ends. The typical variety is known by its very strong and very numerous prickles combined with acuminate leaflets ; β . by similar but shorter prickles and cuspidate leaflets. In γ . the prickles of the barren stems are more slender, whilst those of the panicle are increased in strength and sometimes even hooked, those of the same part in α . and β . being straight. The *var. δ .* is well marked by its short stout declining or often hooked prickles accompanied by long slender ones on the panicle. And the great decrease in the number of the larger prickles, combined with the increased number of aciculi, setæ and hairs in *var. ϵ .* point out its relationship to the next species. By the kindness of Mr. Lees, I possess two specimens of a plant from "the western base of the Malvern Hills" closely resembling *var. ϵ .* ; it is densely hairy throughout, but has very few setæ or aciculi on the barren stems.

Obs. 2. A specimen received from Mr. Lees under the name of *R. pallidus* β . *foliosus* (Lees), seems to occupy an intermediate station between this and the next species ; it may be described as follows, and should its peculiar panicle prove constant is probably specifically distinct.

Stem procumbent (?), angular, dark purple, hairy ; setæ very numerous and unequal ; prickles numerous, slightly declining, straight, rather strong, yellow. Leaves quinate or ternate (?), opaque above, hairy, soft and paler beneath ; terminal leaflet broadly obovate cuspidate. Panicle very long, with numerous short axillary ascending corymbose (?) branches, the three uppermost extrafoliaceous and subtended by long foliaceous bracts ;

rachis and peduncles very hairy, and with numerous unequal yellowish setæ with purple heads, and straight slender declining yellow aciculi and prickles ; *floral leaves* pilose above, soft beneath, *simple* and cordate-ovate, 3-lobed, or the lower ones *ternate*. Calyx hairy, with numerous unequal setæ and aciculi ; sepals with a long leaflike point. Plant only in bud.

Found on the "banks of the Wye near Vaga Cottage, Great Doward, Monmouthshire," *Mr. E. Lees*.

24. *R. hirtus* (W. et N.) ; caule "procumbente tereti" hirto setoso, *aculeis parvis tenuibus* valde inæqualibus multis rectis declinatis, *foliis quinatis* vel ternatis concoloribus pilosis subtus hirtis, foliolo terminali ovato-cuspidato vel ovato-lanceolato, paniculæ valde setosæ tomentosæ vel hirtæ aciculatae racemosæ inferne foliosæ *setis valde inæqualibus* purpureis, sepalis patentibus fructuive adpressis setosis.

Setæ very numerous and very unequal. Panicle with rather distant axillary branches, which are somewhat corymbose and short ; in a Scottish specimen the panicle is quite simple. Upper part of the flowering shoot with strongly deflexed or declining prickles.

a. *hirtus* ; foliis magnis quinatis, foliolo terminali ovali cuspidato, panicula tomentosa.

R. hirtus, *Rub. Germ.* 95. t. 43.

β. *Menkii* ; foliis mediocribus quinatis vel ternatis, foliolo terminali ovali-lanceolato, panicula hirta, sepalis aciculatis.

R. Menkii, *Rub. Germ.* 66. t. 22.

Rare. a. Dumfries-shire. Alborne, Sussex, *Mr. Borrer*. Almond Park, Salop. β. Mount Nod near Tunbridge Wells, *Mr. Borrer* ; Haughton Vale, Cheshire, *Mr. Sidebotham*.

Obs. 1. It is very difficult to point out upon paper any good character by which to distinguish this plant from the following, between which and *R. Kehleri* it forms the connecting link.

Obs. 2. The Rev. W. H. Coleman has sent a specimen under the name of *R. horridissimus* (Colem. MSS.) which seems to be referable to this species. The panicle appears to have been taken from a young plant, and so does not admit of accurate determination ; it is short, narrow, nearly simple ; the two lower axillary branches 3-flowered, very short ; the rest single-flowered and short. Barren shoot rather angular, thickly covered with prickles, aciculi, setæ and hairs merging gradually into each other ; prickles slender, nearly or quite straight, declining. Petioles both general and partial, similarly armed, except that the prickles are deflexed and the hairs much more numerous. Leaves quinate, dull green and pilose above, rather paler, hairy and finely tomentose beneath. Terminal leaflet oblong-ovate acuminate. This plant

is well deserving of attention ; it was found in Easney Park Wood near Ware, Hertfordshire, in flower on the 26th of June 1844.

25. *R. glandulosus* (Bell. !) ; caule arcuato declinatoe tereti vel subanguloso hirto setoso, *aculeis parvis tenuibus inæqualibus rectis declinatis, foliis ternatis* vel quinatis concoloribus pilosis subtus hirtis, foliolo terminali ovali obovato vel obovato-lanceolato, paniculæ valde setosæ hirtæ vel tomentosæ aciculatæ corymbosæ inferne foliosæ *setis brevibus subæqualibus* purpureis, sepalis fructui laxe adpressis reflexisæ setosis.

a. *Bellardi* (Bell Salt. !) ; caule tereti sparsim piloso *valde setoso, aculeis parvis permultis, foliolo terminali ovato cuspidato æqualiter subtiliterque serrato*, paniculæ tomentosæ aculeis multis tenuibus rectis horizontalibus apice et ramis paucis longis distantibus paucifloris corymbosis. *Ann. Nat. Hist.* xvi. 370.

R. *Bellardi*, *Rub. Germ.* 97. t. 44.

R. *glandulosus*, *Eng. Bot. Suppl.* 2883.

β. *Lejeunii* (Bell Salt. !) ; caule subanguloso sparsim piloso setoso, *aculeis plurimum parvis nonnullis longioribus, foliolo terminali ovali cuspidato vel obovato-lanceolato inæqualiter subtiliterque serrato, panicula ramosæ valde tomentosæ setis multis reconditis brevibus aculeisque tenuibus declinatis vel subreflexis.*

R. *Lejeunii*, *Rub. Germ.* 79. t. 31.

γ. *rosaceus* (Bell Salt. !) ; caule subanguloso hirto valde setoso, *aculeis valde inæqualibus, foliolo terminali obovato vel obovato-lanceolato acuminato grosse inæqualiter serrato, paniculæ inferne ramosæ (sæpe ramis duobus maximis) corymbosæ superne hirtæ setis longis prominentibus aculeis declinatis vel subdeflexis.*

R. *rosaceus*, *Rub. Germ.* 85. t. 36.

Rare. a. Terrington Car, Yorkshire, *Mr. Spruce*. β. Selborne, Hants, *Dr. Bell Salter* ; Haughton Vale, *Mr. Sidebotham* ; Channel Islands. γ. Selborne, Hants, *Dr. Bell Salter* ; Twycross, Leicestershire, *Rev. A. Bloxam* ; S. Molton, Devon ; Guildford, Isle of Wight. July and August.

Obs. 1. Observation both of the wild and cultivated plants teaches us that these three varieties are only forms of one species. Although believing this and the preceding species to be specifically distinct, I have found very considerable difficulty in defining them, so as at the same time to include all the varieties of each and also distinguish the species. The leaves of this are nearly always ternate, those of *R. hirtus* quinate, but they both vary in this respect. In that the panicle is rather racemose than corymbose, the contrary being the case in *R. glandulosus*. Here the setæ are usually short, and but little longer than the hairs on the panicle, and mostly equal in length (in *R. Bellardi* (Weihe) they vary in this respect, and on foreign specimens are often

very variable both in length and number), in that they are many of them very long and prominent and very various in length.

Obs. 2. Dr. Bell Salter considers my plants from the Channel Islands to be *R. rosaceus* (Weihe), and therefore refers the *R. Lejeunii* of my 'Manual' (p. 97) to that variety. They seem to me to correspond far more with the figure and description of *R. Lejeunii* (Weihe) as given in the 'Rubi Germanici.' Similarly he refers the plant found at Guildford in the Isle of Wight, and at Twycross, Leicestershire, to *R. Lejeunii*, whilst I consider it to belong to *R. rosaceus*. This shows how closely the plants are allied.

26. *R. humifusus* (Weihe); caule procumbente tereti hirto setoso, aculeis tenuissimis inæqualibus multis declinatis, foliis ternatis vel quinatis subtiliter inæqualiterque serratis subtus pallide viridibus pilosisque, foliolo terminali cordato-ovato cuspidato, paniculæ ramosa inferne foliosæ pilis laxis setis prominentibus aculeisque longis tenuibus declinatis.

R. humifusus, Rubi Germ. 84. t. 35.

Stems, flowering shoots, peduncles and petioles beautifully clothed with slender yellow prickles and aciculi which have a purple base and pass insensibly into very long and slender and very unequal setæ. The lower branches of the panicle elongated, ascending, 3—4-flowered; the others mostly 1-flowered. Stems slender, fuscous, purple.

Glen Falloch, Perthshire. July and August.

27. ? *R. Schleicheri* (Weihe?); caule arcuato vel procumbente subanguloso vel subtereti pilis setisque sparsis, aculeis sparsis inæqualibus rectis declinatis, foliis quinatis vel ternatis pilosis subtus viridibus molliter pubescens, foliolo terminali rotundo breviter acuminato inferne attenuato, paniculæ parvæ setosæ ramis 3—4 distantibus valde paucifloris brevibus corymboque terminali simplici: aculeis multis longis rectis declinatis, sepalis fructus erecto-patentibus.

R. Schleicheri, Leight. ! Fl. Shrop. 237; *Bell Salt. ! in Phytol.* ii. 131.

Rare. Shropshire, *Rev. W. A. Leighton*; Hants, *Dr. Bell Salter*. July and August.

Obs. 1. Although Dr. Salter and I have continued the use of the above name for this plant, we are far from being convinced that it is the species figured and described in the 'Rubi Germanici'; I have therefore not quoted that work. Leighton sent specimens to Nees von Esenbeck, who named them as above, but that does not remove my doubts. Neither am I satisfied that this is a distinct species; it has much the appearance of a plant in one of its earlier stages of growth.

28. *R. Wahlbergii* (Arrh.); caule arcuato obtusanguloso, pilis setisque paucis vel subnullis, aculeis multis valde inæqualibus, foliis qui-

natis subtus pallide viridibus, foliolo terminali late ovato acuminato inferne cordato, ramorum floriferorum cordato inferne lato, panicula longa foliosa aciculata, sepalis fructus patentibus, petalis obovatis inferne attenuatis, "stylis viresentibus."

R. Wahlbergii, *Arrhen. Rub. Suec.* 43; *Godron, Rub. Nancy*, 16; *Bell Salt.* in *Ann. Nat. Hist.* xvi. 371.

Stem nearly terete at its base, obtusely angular above. Prickles very numerous and very unequal, straight, rather declining; on the autumnal shoots and the petioles hooked. Leaves cuspidate-dentate-serrate. Stipules of the flowering shoot narrow. "Torus conical. Fruit blue-black." Panicles with very numerous, long, strong, declining prickles.

Hedges in the south of England. August.

Obs. 1. In some states this plant closely resembles *R. coryliifolius*, which differs from it by having equal prickles on a subterete stem, those on the petioles nearly straight; the torus "roundish-clavate." Between this and the following species the specific character is a sufficient distinction.

Obs. 2. A state of arrested development occurs in this plant in more shady places when the stem is suberect and the panicle very short with large leaves amongst the flowers; it is the *R. Wahlbergii* β . *frustratus* (Bell Salt.), 'Ann. Nat. Hist.' xvi. 371. Similar states occur in other species.

29. *R. nemorosus* ("Hayne"); caule arcuato subanguloso, pilis setisque paucis, aculeis multis valde inæqualibus, foliis quinatis subglabris subtus pallidioribus mollibus, foliolo terminali rotundato-cordato cuspidato, ramorum floriferorum ovato inferne attenuato, panicula subsimplici, petalis subrotundis, "stylis dilute carneis."

R. nemorosus, "Hayne, Arzneyg. iii. t. 10;" *Wimm. et Grab. Fl. Siles.* ii. 34; *Arrhen. Rub. Suec.* 45.

R. dumetorum, *Rub. Germ.* 98. t. 45; *Godron, Rub. Nancy*, 12; *Bab. Man.* 97.

R. coryliifolius, *Wallr. Sched. Crit.* 230.

Stem nearly terete at its base, obtusely angular above. Prickles most numerous and shorter near to the base of the stem, straight, nearly horizontal; on the autumnal shoots and the petioles hooked. Leaves cuspidate-serrate. Stipules of the flowering shoot narrow. "Torus conical. Fruit blue-black."

α . *glabratu*s; foliis subtus hirtis pallide viridibus, caule florifero tomentoso, caule subtereti subglabro.

β . *pilosu*s; foliis subtus molliter hirtis pallide viridibus, caule florifero et sterili subtereti tomentosis.

γ . *bifrons*; foliis subtus albidis tomentosis, caule florifero tomentoso pedunculis pedicellisque aculeis longis rectis validis armatis, caule subglabro similiter aculeato.

R. bifrons, *Vest. in Tratt. Ros. Monog.* iii. 28.

d. horridus ; foliis subtilis viridibus pilis longis mollibus ornatis, caule florifero hirto aculeis multis longis subtenuibus, sepalis saepissime aciculatis, caulis aculeis multis longis inaequalibus declinatis.

R. diversifolius (*Lindl.* !), *Leighton, Fl. Shrop.* 237.

Hedges and thickets. July and August.

Obs. 1. There seems to be no doubt of this being the plant intended by Hayne, although I have not seen the work quoted, and as his name is older than that of Weihe I have adopted it. None of the figures in the 'Rubi Germanici' exactly represent our plants.

Obs. 2. Some of the forms of this plant, especially *var. γ*, have been mistaken for *R. corylifolius* (*Sm.*), from which it differs in the same respects as the preceding species.

30. *R. cæsius* (*Linn.*) ; caule procumbente tereti glauco, aculeis tenuibus subulatis inaequalibus rectis, *foliis ternatis, foliolo terminali rhomboideo-ovato* acuminato, panicula simplici, "petalis ob-ovatis emarginatis stylis virescentibus," sepalis fructui glauco ad-pressis.

R. cæsius, *Eng. Bot.* 826 ; *Rub. Germ.* 102. t. 46.

Stems usually slender. Prickles very various in number but always slender. Occasionally the terminal leaflet is divided quite to its base into three distinct leaflets, the whole thus forming a quinate-pinnate leaf, when the plant is the variety *pseudo-ideus* of the 'Rubi Germanici'; sometimes, in the variety *pseudo-cæsius* of the same work, that leaflet is deeply three-lobed and slightly cordate below; both may be found upon the same stem. The lateral leaflets are often deeply divided into a larger and a smaller lobe, but I have never seen true *R. cæsius* with the lobes separated into distinct leaflets, neither do authors mention any such case.

Hedges and thickets. June to August.

Obs. The ternate leaves, of which the lateral leaflets are strongly lobed below, and the terminal leaflet rounded but scarcely ever at all cordate at its base, all of them coarsely serrate, inciso-serate or even lobed; the very slender prickles on the round stem; the simple panicles and glaucous fruit, which usually consists of very few large drupes; distinguish this plant from all the preceding, except *R. tenuis*, in which the prickles are much stronger on all parts of the plant, and there are no setæ on the barren stem.

B. HERBACEI.

31. *R. saxatilis* (*Linn.*) ; caule tenui radicante inerme vel aciculis paucis herbaceis distantibus exasperato, caule florifero erecto, *corymo terminali paucifloro*, petalis ovalibus calycem subæquantibus, *foliis ternatis*.

R. saxatilis, *Eng. Bot.* 2233 ; *Rub. Germ.* 30. t. 9.

Root perennial. Rooting stems annual, very slender and long. Flowering shoots 3—12 inches high, downy. Flowers yellow. Fruit of 1—4 large red drupes.

Stony mountains; rare. July and August.

32. *R. arcticus* (Linn.); caule erecto inermi herbaceo, flore terminali solitario, petalis obovatis calyce duplo longioribus, staminibus conniventibus, foliis ternatis.

R. arcticus, *Eng. Bot.* 1585; *Rub. Germ.* 3. t. 48.

Root perennial. Stems subterraneous, creeping. Flowering shoots 4—6 inches high. Flowers rose-coloured. Fruit of rather numerous purplish-red drupes.

Said to have been found on mountainous parts of the isle of Mull, *Rev. Dr. Walker*; and on Ben-y-Glo, *Mr. Cotton*; but a very doubtful native. May.

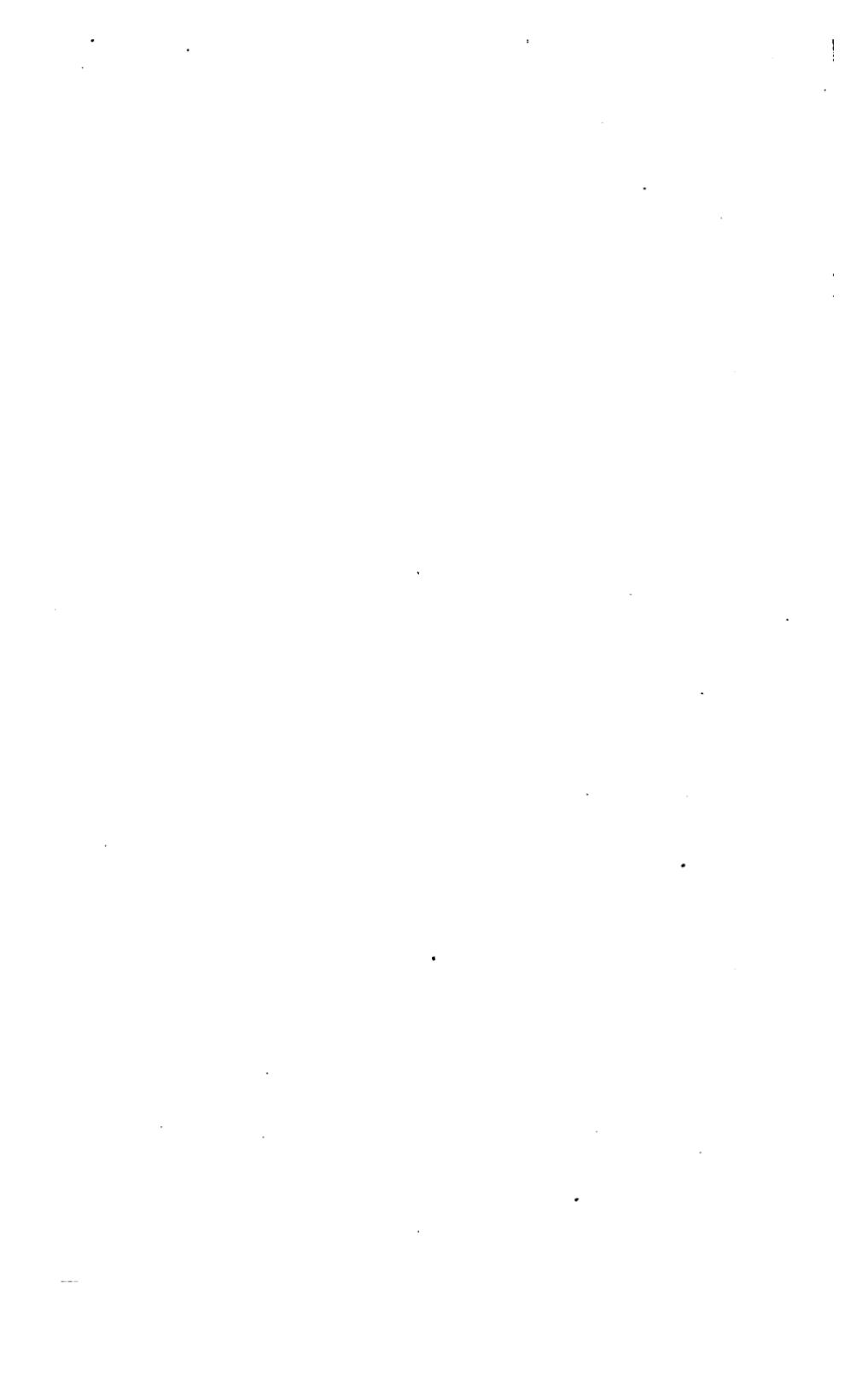
33. *R. Chamæmorus* (Linn.); caule erecto inermi herbaceo, flore terminali solitario, foliis simplicibus lobatis plicatis.

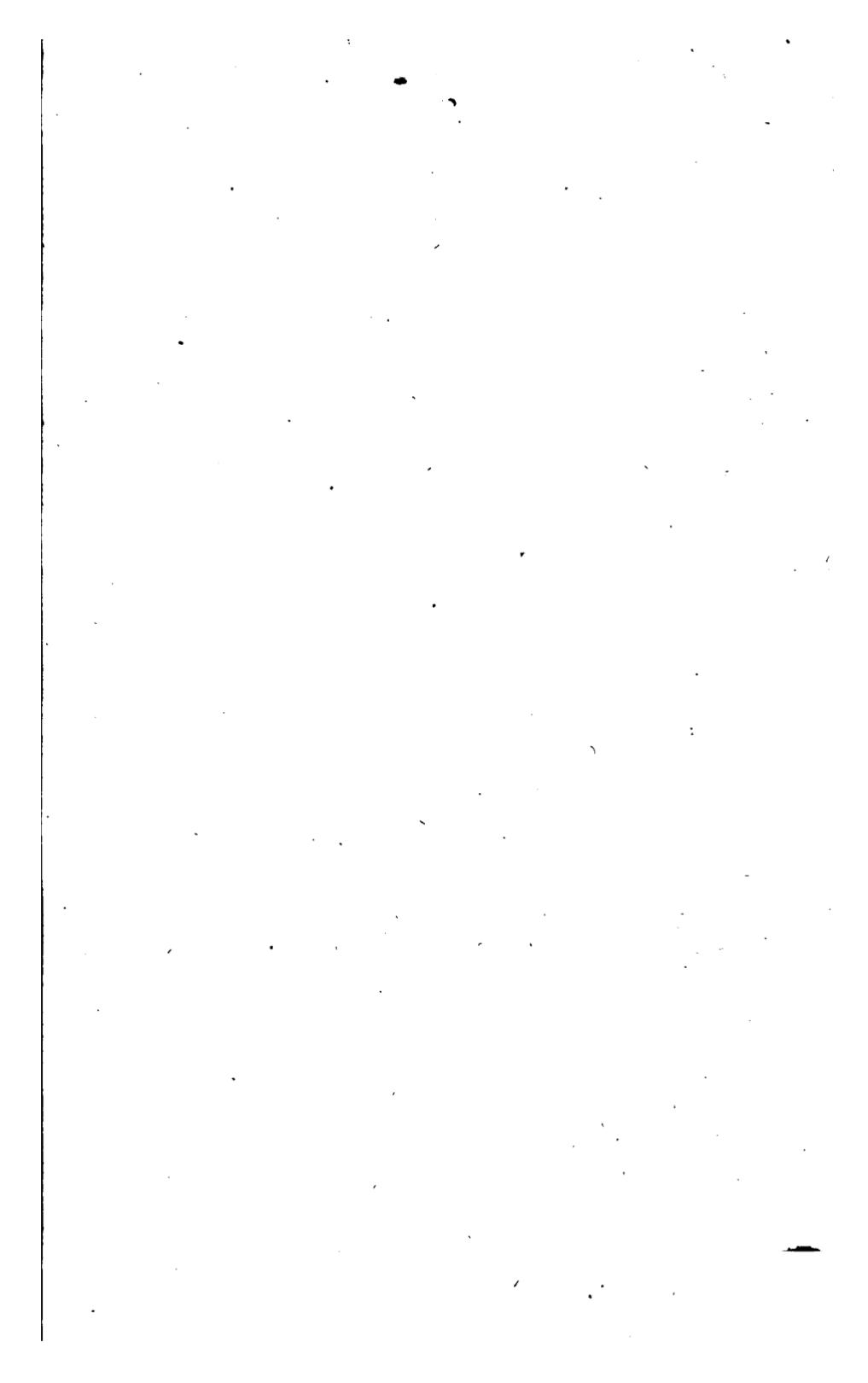
R. Chamæmorus, *Eng. Bot.* 716; *Rub. Germ.* 113. t. 49.

Root perennial. Stems subterraneous, creeping. Flowering shoots 6—10 inches high. Flowers large, white, dioecious. Fruit large, red, afterwards orange-yellow.

Alpine turf bogs. Junc.

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